HAMSTRING MUSCLE LENGTH AND PELVIC TILT RANGE IN INDIVIDUALS WITH AND WITHOUT LOW BACK PAIN

By

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INTRODUCTION

- Forward bending (FB) = lumbar flexion + pelvic rotation.
- Poor hamstring flexibility = limit FB unless compensated for by increased lumbar flexion.
- Lumbar flexion a developmental factor of low back pain (LBP).
STATEMENT OF PROBLEM

- No relationship between HML & PTR in Static standing (Mohammed et al, 2002; Kendall et al, 2005)
- Previous researchers have suggested no relationship exists during static standing (Nourbakhsh & Arab, 2002; Congdon et al, 2005)
- What will be the relationship in FB?
OBJECTIVE

- To compare each of HML and PTR in individuals with and without LBP
- To investigate relationship between HML and PTR in the two groups during FB
This study showed that no causal relationship exists between HML and PTR during FB.

It has further given credence to the measurement of HML when evaluating LBP patients.
PARTICIPANTS

- 30 (16 females, 14 males) - LBP group.
- 30 (14 females, 16 males) - without LBP group.
METHOD

- Research protocol: approved by UI/UCH Institutional Research Committee (UI/EC/11/0087).
- Study design - Ex post facto
- Consecutive sampling technique
- HML - active knee extension test (Norris & Matthew, 2005).
- PTR during dynamic FB - Acumar™ Digital Inclinometer (Bierma-Zeinstra et al., 2001)
DATA ANALYSIS

- Descriptive statistic; to summarize data,
- Pearson Product Moment Correlation to investigate the relationship between HML and PTR of the two groups and
- Independent ‘t’-test to determine HML and PTR differences in the two groups with
- Alpha level set at 0.05.
## RESULTS

### TABLE 1: PHYSICAL CHARACTERISTICS OF PARTICIPANTS

<table>
<thead>
<tr>
<th></th>
<th>With LBP (n=30)</th>
<th>Without LBP (n=30)</th>
<th>Calculated t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>53.70 ± 8.62</td>
<td>26.07 ± 5.70</td>
<td>14.65</td>
<td>0.00**</td>
</tr>
<tr>
<td>Weight</td>
<td>66.83 ± 9.50</td>
<td>69.50 ± 6.50</td>
<td>-1.27</td>
<td>0.21</td>
</tr>
<tr>
<td>Height</td>
<td>1.66 ± 0.08</td>
<td>1.69 ± 0.05</td>
<td>-1.64</td>
<td>0.11</td>
</tr>
</tbody>
</table>

(α = 0.05)

** = significant difference

M – Mean

S.D – Standard deviation
## RESULTS

- **TABLE 2: COMPARISON OF MEASURED VARIABLES BETWEEN THE GROUP WITH AND WITHOUT LBP**

<table>
<thead>
<tr>
<th>Variable</th>
<th>With LBP (n=30)</th>
<th>Without LBP (n=30)</th>
<th>Calculated t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AKE</td>
<td>M ± S.D = 142.10 ± 123 – 157</td>
<td>M ± S.D = 147.67 ± 133 – 163</td>
<td>t = -2.61</td>
<td>p-value = 0.01**</td>
</tr>
<tr>
<td>Test</td>
<td>8.85</td>
<td>7.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pelvic</td>
<td>M ± S.D = 16.20 ± -29 – 42</td>
<td>M ± S.D = 9.00 ± -21 – 30</td>
<td>t = 1.66</td>
<td>p-value = 0.10</td>
</tr>
<tr>
<td>Tilt</td>
<td>18.47</td>
<td>14.96</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(α = 0.05)

** = significant difference

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## RESULTS

**TABLE 3:** RELATIONSHIP BETWEEN HAMSTRING MUSCLE LENGTH AND PELVIC TILT IN GROUP WITH LBP AND GROUP WITHOUT LBP

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pearson Correlation</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>With LBP</td>
<td>-0.068</td>
<td>0.722</td>
</tr>
<tr>
<td>Without LBP</td>
<td>-0.019</td>
<td>0.919</td>
</tr>
</tbody>
</table>

$(\alpha = 0.05)$
DISCUSSION, CONCLUSION & IMPLICATION

- Contrary to previous report (Bellew et al., 2010), no significant relationship exists between HML and PTR in the two groups.
- This study has shown a normal static state of the spine, to dispel the idea of an increase in PTR with concomitant increased lumbar lordosis in patients presenting with LBP.
- Therapist are encouraged to evaluate hamstring flexibility in LBP patients.


